AMERICAN ARBITRATION ASSOCIATION

In Re the Arbitration of COVAD COMMUNICATIONS COMPANY, Claimant and PACIFIC BELL, Respondent	)	Case No. 74 Y181 0313 98 **Interim Opinion With Respect To Covad's Telecommunications Act Claims**

WE, THE UNDERSIGNED ARBITRATORS, having been designated in accordance with the Arbitration Agreement entered into by the above-named parties dated April 21, 1997, and having been duly sworn and having duly heard and examined the submissions, proofs and allegations of the Parties, Find and Conclude with respect to Covad's claims under the Telecommunications Act as follows:

JURISDICTION

1. The arbitrators' jurisdiction is based on the Interconnection Agreement between Covad Communications Company ("Covad") and Pacific Bell ("Pacific") dated April 21, 1997 ("the Agreement"). The Agreement provides (in relevant part) in Section 18:

> 18.1 Any controversy or claims arising out of or relating to [the] Agreement or any breach hereof, shall be settled by arbitration in accord with the Commercial Arbitration Rules of the American Arbitration Association ("AAA"). . . .
>
> 18.2 The AAA panel shall award costs, including reasonable attorney's fees, to the successful Party at the conclusion of the hearing. Should any party refuse to arbitrate controversies or claims as required by this Agreement, or delays the course of arbitration proceedings beyond the times set, or permitted by the AAA panel, then such Party shall pay all costs, including reasonable attorney fees, of the other Party, incurred with respect to the entire arbitration and or litigation process, even though such refusing or delaying Party may ultimately be the successful Party in the arbitration and/or litigation.
>
> 18.3 The judgment upon the award rendered may be entered in the highest Court of the forum capable of rendering such judgment, either State or Federal, having jurisdiction and shall be deemed final and binding on both of the Parties.

COVAD'S TELECOMMUNICATIONS ACT CLAIMS*

2. Covad claims that Pacific has violated its statutory duty under the Telecommunications Act and the corresponding FCC regulations by:

> (1) Failing to provide for physical collocation of equipment necessary for interconnection.
> (2) Failing to negotiate in good faith by its unjustified insistence on caged physical collocation and by its failure to cooperate to resolve its alleged interconnection space limitations.
> (3) Failing to provide collocation and interconnection on "just, reasonable and nondiscriminatory terms."

The panel has found, as set forth in the Interim Opinion With Respect To Covad's Claims For Breach Of The Interconnection Agreement, that Pacific failed to provide collocation and interconnection on just and reasonable terms. Its actions in that regard, which were also actions in breach of the Agreement, are set out in paragraphs 8 and 11-16. (Although the panel did find that Pacific failed to negotiate in good faith to resolve new or open issues in breach of Section 34 of the parties' Agreement, it does not find that the alleged failures to negotiate in good faith regarding caged physical collocation or to resolve interconnection space limitations violate the Act.)

3. Section 251(b) of the Telecommunications Act imposes on Pacific duties to interconnect, to resell at wholesale services that are offered at retail, and to provide unbundled access on terms that are "just, reasonable and nondiscriminatory" and in accordance with their agreements. Section 251(c) imposes, among other things, an obligation to negotiate in good faith.

4. Pacific contends that the Act does not provide for a private right of action for violations of Sections 251 and 252. It asserts that "[t]he only way for parties to avail themselves of rights under Section 251 is through the negotiation and arbitration process of Section 252; once an interconnection agreement is entered, the parties' rights and duties are governed by the agreement, not by the substantive provisions of the Act." [Pacific's Post Arbitration Brief at 3]

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* The panel issued a tentative Interim Opinion With Respect to Covad's Telecommunications Act Claims on November 24, 1998 and asked for further briefing from the parties addressing the conclusions in the tentative Opinion. The parties submitted briefs and reply briefs, and Pacific requested oral argument. Argument was heard on January 5, 1999. The panel appreciates the efforts of both parties in addressing the issue of whether a private right of action exists for violation of Section 251.

5. Covad's claim under the Telecommunications Act was also brought in the federal district court. The district court stayed the claim pending arbitration. The panel is mindful of the district court's comments in ordering the stay. In a footnote, the court said:

> As an alternative ground for dismissing the Section 251 claims, Pacific argues that federal law does not provide a private right of action for violations of Section 2512. While the Court has serious doubts regarding the existence of a private right of action for Section 251 violations, this issue is not addressed at this time because Pacific's argument under the arbitration clause is dispositive of the current motion. [Order dated November 17, 1998, at 5]

6. Pacific contends here and contended in the district court that no private right of action exists under the Telecommunications Act where a party alleges that a voluntary agreement violates the requirements of Section 251. Pacific argued to the district court that "they [Covad] could come here under (e) (6) if they had arbitrated. They didn't do that, and that's the only remedy that congress has provided." [See Transcript of Proceedings, Friday, October 23, 1998 at 40] However, Covad's claim, as the panel understands it, goes beyond the assertion that Pacific did not negotiate the Agreement in good faith. Covad has made claims under both Sections 251 (b) and (c).

7. Three jurisdictional provisions--Sections 206, 207 and 252 (e) (6)--have been variously argued by the parties. The parties agree that neither Section 206 nor Section 207 independently give rise to a cause of action; rather, they create a remedy for the violation of some other provision of the Act. Where the parties differ is whether those sections create a remedy for violation of the provisions of Section 251. Section 206 of the 1934 Federal Telecommunications Act provides:

> In case any common carrier shall do, or cause or permit to be done, any act, matter or thing in this chapter prohibited or declared to be unlawful, or shall omit to do any act, matter, or thing in this chapter required to be done, such common carrier shall be liable to the person or persons injured thereby for the full amount of damages sustained in consequence of such violation. . . ."

Section 207 of the 1934 Telecommunications Act provides:

> Any person claiming to be damaged by any common carrier subject to the provisions of this chapter may either make complaint to the Commission as hereinafter provided for, or may bring suit for the recovery of the damages for which such common carrier may be liable under the provisions of this chapter, in any district court of the United States of competent jurisdiction, but such person shall not have the right to pursue both such remedies.

8. Section 252 is titled "Procedures for negotiation, arbitration, and approval of agreements." It sets forth a structure for agreements between ILECS and carriers

requesting interconnection, services or network elements pursuant to Section 251. The agreements may be reached either by negotiation or, if after a certain period of time there are still unresolved issues, by petitioning for arbitration before the state commission. The state commission is empowered under the act to make "determinations" of issues such as just and reasonable interconnection and network element charges. Section 252 (e) provides for approval by the state commission of any interconnection agreement adopted by either negotiation or arbitration. In reviewing a negotiated agreement, which may be entered "without regard to the requirements of section 251 (b) and (c)," the commission's jurisdiction is limited to determining whether the agreement discriminates against other carriers or is inconsistent with the public interest. Finally, Section 252 (e) (6) provides, in relevant part:

> (6) Review of State commission actions
> In any case in which a State commission makes a determination under this section, any party aggrieved by such determination may bring an action in an appropriate Federal district court to determine whether the agreement or statement meets the requirements of section 251 of this title and this section.

9. On its face, Section 252 (e) (6) has virtually nothing do with the issue at hand: whether Covad can bring an action against Pacific for violations of Sections 251 (b) and (c). Covad and Pacific entered into a negotiated agreement. The state commission did not make any "determinations" in an arbitration; it did made a "determination" that the agreement as negotiated did not discriminate against other telecommunications carriers and was not inconsistent with the public interest. *AT&T Communications of Illinois, Inc. v Illinois Bell Tel Co.*, 1998 U.S. Dist. LEXIS 12925*11 (N.D. Ill August 17, 1998) However, Covad does not claim to be aggrieved by a determination of the state commission. It claims that it was injured by Pacific's failure to comply with the duties imposed on it under Section 251. The question is not whether Section 252 (e) (6) provides Covad with a right of action. Clearly, it does not. The question is whether the procedure authorized by Section (e) (6) is the sole relief offered to parties seeking redress for alleged violation of Sections 251.

10. Neither party has cited case authority that is directly on point, either here or in the district court. Pacific cited *Citizens' Utility Ratepayer Board v. McKee*, 946 F. Supp. 893 (D. Kan. 1996) in the district court for the proposition that "Section 252 (e) (6), which was part of the 1996 Act, limits this Court's jurisdiction to adjudicate actions alleging violations of Section 251 of the Act." Quoting the Kansas district court's discussion of its lack of jurisdiction under Section 252 (e) (6), Pacific concluded that "Thus, under Section 252 (e) (6), a federal court action alleging violation of Section 251 is contemplated only where a party has sought pre-contract arbitration before a state regulatory commission and then seeks judicial review of that decision." That is not a conclusion that can be reached on the authority of the *Ratepayer* case.

11. The decision in *Ratepayer* was grounded in the court's finding that the plaintiff was not an "aggrieved" party under Section 252 (e) (6). The plaintiff was seeking the court's order to intervene in arbitration proceedings ordered by the Kansas commission to

resolve disputes between requesting carriers and existing local exchange carriers. Construing the parameters of jurisdiction that Congress provided in Section 252 (e) (6), the court determined that an "aggrieved party" must be either the interconnecting service provider or the local exchange carrier who is affected adversely by a determination of the state commission in an arbitration pursuant to Section 252 (b). The plaintiff was neither, and therefore did not have standing to bring an action in federal court under Section 252 (e) (6) to intervene in the arbitration. The court in *Ratepayer* was determining the limits of its jurisdiction under Section 252 (e) (6). It did not address the question of jurisdiction under other sections, and the decision says nothing about the jurisdiction of a federal court in a case brought under Sections 206 and 207 against a common carrier for violations of Section 251.

12. Pacific further argued to the district court that by explicitly providing in Section 252 (e) (6) for federal district court jurisdiction to review state commission determinations whether an agreement meets the requirements of section 251, the Act implicitly limits the jurisdiction of the district court to only those actions. [See Transcript of Proceedings, Friday, October 23, 1998 at 42-43] However, that paints with too broad a brush in this context. Section 252 (e) (6) of the Act addresses the right of an "aggrieved" party to seek district court review of state commission determinations. It does not address the right of a party to bring suit against a common carrier for violations of the Act. That right is specifically addressed in Sections 206 and 207 (which do not provide for any action against or review of determinations of a state commission, but only for actions against "common carriers").

13. Both parties have cited *Iowa Utilities Board v. FCC*, 120 F. 3d 753 (8th Cir. 1997), reversed and remanded in *AT&T Corp. v Iowa Utilities Board*, 1999 U.S. LEXIS 903 (January 25, 1999), either in submissions to the district court or to the panel. The primary issue in that case was whether the FCC exceeded its jurisdiction in its First Report and Order by promulgating pricing rules regarding local telephone service, as well as other rules. It was essentially a jurisdictional debate between state commissions and the FCC. Much of the parties' argument is rendered obsolete by the opinion of the Supreme Court. The Court's opinion does not address the issue of a private right of action. However, the discussion of the FCC's rulemaking authority, grounded in Section 201(b) amending the 1934 Act in 1938, clarifies the relationship between the 1996 Act and Sections 206 and 207. The Court noted that "Congress expressly directed that the 1996 Act, along with its local-competition provisions, be inserted into the Communications Act of 1934" and accordingly found that the power granted the FCC under the 1938 amendment extended to implementation of the provisions of the 1996 Act. 1999 U.S. LEXIS 903, *18. Following the same reasoning, Section 206 and 207 would apply to violations of Section 251.

14. The court in *MCI Communications Corp v. American Tel. & Tel. Co.*, 462 F. Supp. 1072, 1086-88 (N.D. Ill. 1978), cited by Covad, was examining the question whether MCI's right of action for alleged antitrust violations was limited to a proceeding under Sections 206 and 207. While not on point, the court's rationale is helpful in

determining whether Covad can claim damages for a breach of Sections 251(b) and 251(c) under 206 and 207. The court said:

> [W]hen MCI is complaining about an injury it has suffered as a customer of AT&T by reason of discriminatory service, MCI may have a remedy under Section 207. When, on the other hand, MCI is complaining of injuries it has sustained as a competitor which has been excluded from its legitimate share of the market, Section 207 provides no remedy whatsoever.

The court also noted that Section 207 gives district courts concurrent jurisdiction with the FCC over Telecommunications Act claims.

15. *Maydak v. Bonded Credit Co.*, 96 F. 3d 1332, 1334 (9th Cir. 1996), cited by Covad, is again helpful only for the court's discussion, not because it is on point. In *Maydak*, a pro se plaintiff brought suit against a collection agency for a declaratory judgment that he was not liable for amounts allegedly owed for calls made to a 1-900 number. He asserted that the charges at issue were originally billed by AT&T in violation of the tariff that it was required to file under the Federal Communications Act (47 USC Sections 203 (a) and (c)), and that therefore his action arose under the Act. Noting that "private actions are generally limited to those explicitly authorized by the Act" and quoting Section 207, the court said:

> If Maydak had sued AT&T for a violation of a stated statutory provision, the district court would clearly have had subject matter jurisdiction under Section 207. But . . .Maydak sued only [the collection agency] which is not a common carrier. Accordingly, we hold that Maydak's action did not fall within the express language of Section 207. [Citations omitted]

16. Pacific relies here on *AT&T Communications of Illinois, Inc. v Illinois Bell Tel Co.*, 1998 U.S. Dist. LEXIS 12925 (N.D. Ill August 17, 1998) ("*Ameritech*"). That case again illustrates the limitations on a federal court's jurisdiction under Section 252 (e) 6. Pacific acknowledges that the case is not on point, but asserts that the court's reasoning "which emphasized that the Act does not require that terms of the [agreement] be consistent with the standards set forth in section 251" precludes the argument that AT&T's claim could have been brought under another section of the Act. The parties were AT&T, "not currently a provider of local telephone services" and Illinois Bell Telephone Company (Ameritech), an ILEC. AT&T and Ameritech had entered into a part-arbitrated, part-negotiated agreement. AT&T was before the court seeking review of some of the arbitrated provisions and also of Ameritech's interpretation of certain negotiated provisions. AT&T alleged that Ameritech's interpretation of the negotiated provisions was inconsistent with the requirements of the Act. Ameritech moved to dismiss the counts related to the negotiated provisions. The district court, reciting the Section 252 procedures for negotiation, arbitration, review and approval of agreements, concluded that it lacked subject matter jurisdiction to review the alleged misinterpretation of negotiated provisions. The court reasoned that since AT&T was not requesting a review of the State Commission's determination of nondiscrimination and public interest with respect to the negotiated provisions—the only "determination" the Commission was empowered to make—AT&T was not an "aggrieved" person. In effect, *Ameritech* is

twice removed: Covad is not seeking review of a negotiated provision of the Agreement, and in any event, the provisions of the Agreement were, from every indication in the Agreement, intended to be and are consistent with the standards set forth in Section 251.

17. *Goldwasser v. Ameritech Corp.*, 1998 U.S. Dist. LEXIS 1463 (N.D. Ill February 3, 1998), also cited by Pacific, has dicta that is the strongest support offered for Pacific's position. In *Goldwasser* the court granted Ameritech's motion to dismiss the complaint of a local telephone service subscriber asserting that Ameritech denied its competitors many of the elements which it was required to make available pursuant to the Telecommunications Act. Claims were brought under Section 2 of the Sherman Act and under Sections 206 and 207 of the Telecommunications Act.

18. Ameritech's arguments relevant here were that (1) the *Goldwasser* plaintiffs had no standing to assert the Telecom Act claim; and (2) the claim was without merit because the 1996 Act "does not establish free-standing duties for which consumers can bring private actions for violations thereof." 1998 U.S. Dist. LEXIS 1463*7.

19. As to standing, the court noted that plaintiffs cited Section 206 "which seemingly afford[s] them a right to sue." The court said:

> The 1996 Act envisions that the opening of the local telephone markets is primarily a matter between local carriers, carriers seeking entry into the local markets and the state regulatory commissions. The 1996 Act has established a detailed regime of negotiation, mediation, arbitration, regulatory evaluation and federal court review—all of which are directed at incumbent local carriers and their prospective competitors.

Finding that "[plaintiffs'] claims could severely threaten the delicate balance that Congress has struck in attempting to ease the transition of the telecommunications industry into a competitive marketplace," the court held that plaintiffs had "no standing to bring claims seeking to require Ameritech to comply with its duties to prospective competitors under the 1996 Act." 1998 U.S. Dist. LEXIS 1463*26-30.

20. The court also found that plaintiffs could not sue Ameritech pursuant to Sections 206 and 207 for Ameritech's alleged failure to comply with sections 251 and 252. The court said:

> Sections 251 and 252 require Ameritech to provide certain access to its facilities, but only when "any requesting telecommunications carrier" seeks to enter their local market. These duties exist, therefore, only within the framework of the negotiation/arbitration process which the Act established to facilitate the creation of local competition. . . If there are problems with carriers (such as Ameritech) failing to satisfy these duties to their competitors, the Act establishes the sole remedy: state PUC arbitration and enforcement proceedings, with review by federal courts.

The court held that "[s]ince these sections do not establish duties that Ameritech owes to consumers, Plaintiffs cannot sue Ameritech for its alleged breach of these duties." 1998 U.S. Dist. LEXIS 1463*26-30.

21. Unlike Ameritech in *Goldwasser*, Pacific does unquestionably owe "these duties" to Covad, both under Section 251 and Section 252. As the Supreme Court said in the *Iowa Utilities Board* opinion, "It would be gross understatement to say that the Telecommunications Act of 1996 is not a model of clarity. It is in many important respects a model of ambiguity or indeed even self-contradiction." 1999 U.S. LEXIS 903 *47. Nevertheless, the statutory language establishes "duties" of telecommunications carriers and "obligations" of local exchange carriers. The Act proclaims its purpose "to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications customers and encourage the rapid deployment of new telecommunications technologies." Act, Statement of Purpose. In that context, the panel is unwilling to rule that it was the intention of Congress to limit the remedies available to the group most interested in enforcing the rights provided by the Act: the CLECs attempting to establish themselves as competitors.

22. Covad claimed and the panel found that Covad has suffered injury from Pacific's violation of stated statutory provisions under the Act, as set out above, to interconnect and to provide collocation on terms that are "just, reasonable and nondiscriminatory, in accordance the terms and conditions of the agreement and the requirements of this section [251] and section 252 of this title." Covad has stated and proved a claim under the Telecommunications Act and may seek its remedies in federal court pursuant to Sections 206 and 207, or, in accordance with the court's stay, in this arbitration. (Covad claims that Pacific's conduct also violates Sections 201, 202 and 252 of the Act. Covad's evidence with respect to bad faith negotiations in violation of Section 252 is unpersuasive. The authorities cited by Covad in support of its invocation of Sections 201 and 202 are not sufficient for the panel to make a determination on the applicability of those sections.)

Limitation of Liability With Respect To Claims Under the Telecommunications Act

23. Pacific has asserted that if the panel finds that Covad has a cause of action for violation of Section 251, then Section 26 of the parties' Agreement must be interpreted to prohibit Covad's claims for lost profits based on violation of the Telecommunications Act. In addition, Pacific argues that if the panel finds that Section 26 does limit Pacific's liability for violations of law but that the limitation is void, then the entire Agreement is void. Section 26 of the parties' Agreement provides:

> Except as otherwise provided herein, neither party shall be liable to the other in connection with the provision or use of services offered under this Agreement for indirect, incidental, consequential, special damages, including (without limitation) damages for lost profits, regardless of the form of the action, whether in contract, indemnity, warranty, strict liability, or tort.

Covad argues that the Section 26 language is not sufficiently express and unequivocal to be interpreted as limiting Pacific's liability for violation of statutory law.

24. Commercial entities such as Covad and Pacific "are entitled to contract to limit the liability of one to the other, or otherwise allocate the risk of doing business."

However, that entitlement has boundaries. California Civil Code Section 1668 provides some of those boundaries:

> All contracts which have for their object, directly or indirectly, to exempt anyone from responsibility for his own fraud, or willful injury to the person or property of another, or violation of law, whether willful or negligent, are against the policy of the law.

Although Section 1668 has not been interpreted to prohibit all exculpatory clauses, it has been generally enforced with respect to clauses purporting to contract away liability for fraudulent, intentional or negligent violations of statutory law. *Gardner v. Downtown Porsche Audi*, 180 Cal App. 3d 713,716 (1986); *Delta Airlines v. Douglas*, 238 Cal App. 2d 95, 105 (1965). Accordingly, if Section 26 is interpreted to limit Pacific's liability for violations of statutory law, to that extent the limitation of liability is void.

25. The issue whether a limitation of liability applies usually arises in connection with allocation (or purported allocation) of the risk for negligence. In that context "contractual clauses seeking to limit liability will be strictly construed and any ambiguities resolved against the party seeking to limit its liability for negligence." *Philippine Airlines, Inc. v. McDonnell Douglas Corp.*, 189 Cal. App. 3d 234, 237 (1987).

26. Analyzing the applicability of Section 26 by analogy to the negligence cases brought to the panel's attention by the parties, it is clear that if Pacific intended to protect itself from damages based upon a violation of law, it was required to say so in so many words. For example, a key factor in the court's analysis in *Philippines Airlines* was the "express and unequivocal language in the agreement" which precluded liability for negligence. The clause stated, in relevant part:

> The warranty and service life policy provided in this article and the obligations and liabilities of seller hereunder said warranty and service life policy are exclusive and in lieu of, and buyer waives all other remedies, warranties, guarantees or liabilities, express or implied, with respect to each aircraft, product and article delivered hereunder, arising by law or otherwise (including, without limitation, any obligation or liability of the seller arising from negligence or with respect to fitness, merchantability, loss of use, revenue or profit or consequential damages.)

27. In contrast to that express reference to exculpation for negligence, the limitation of liability here refers to damages that might reasonably be expected to arise in a commercial setting—i.e., "in connection with the provision or use of services offered under [the] Agreement"— and to be sought under customary commercial forms of action: "contract, indemnity, warranty, strict liability or tort." The inclusion of "tort" in the list of forms of actions would probably not be construed as sufficiently express and unequivocal, for instance, to cover a claim for negligence, *Philippines Airlines*, 189 Cal. App. 3d at 239, and there is a virtually complete absence of express and unequivocal language that would put Covad on notice that not only was it contracting away its right to sue Pacific for lost profits resulting from contractual breaches, but also for lost profits arising from violation of statutory law.

28. The panel concludes that under California law Section 26 is not sufficiently specific to establish an agreement to shield Pacific from damages resulting from violations of law. Thus the limitation of liability is not void as against public policy expressed in Civil Code Section 1668, and the question whether the entire Agreement is void under Civil Code Section 1608 does not arise.

CONCLUSION

29. Because it was uncertain whether or if Covad's Telecommunications Act would be heard by the district court, or if the claim would be heard in the arbitration, what damages would be available, lost profits damages were neither discovered nor presented in the hearings. In light of the panels' opinion, Pacific is entitled to take discovery regarding Covad's alleged lost profits. During February Pacific may serve a document request on Covad relating to Covad's lost profits claim. Covad shall respond and produce responsive documents 30 days thereafter. Pacific may propound 15 interrogatories to Covad within 20 days of receiving Covad's damages documents. If either Pacific or Covad determines to use an expert witness or witnesses with regard to damages, then the disclosure procedures set forth in the panel's scheduling order shall apply. A hearing on the subject of damages shall be scheduled during the week of June 14, 1999. The parties are requested to submit to the Panel by February 26, 1999, an agreed schedule for discovery and briefing as well as their estimate of time required for a hearing. If they are unable to do so, either party may invoke the process set forth in paragraph 33 of the panel's Interim Opinion With respect to Covad's Claims for Breach of the Interconnection Agreement.

Dated: February 2, 1999

Lois W. Abraham

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Southwestern Bell Plans Major Launch of New Lightning-Fast Service for Data, Internet Access

Parent Company SBC Announces Largest Deployment of ADSL in the U.S. and Major Price Drop to Make Service Affordable for Millions of Customers

San Antonio, Texas, January 12, 1999

Regulatory decisions key to scope of deployment

For up-to-the-minute news, visit http://www.swbell.com/dsl

The wait for affordable, high-speed, high-bandwidth Internet access may be near an end for millions of consumers and businesses. Southwestern Bell today announced plans to offer lightning-fast Internet and data access service in its five-state region beginning this year and today is filing the necessary tariffs with the Federal Communications Commission.

The launch of Asymmetrical Digital Subscriber Line (ADSL) in Southwestern Bell's five-state region of Texas, Missouri, Oklahoma, Arkansas and Kansas is part of a broader plan by SBC Communications, Southwestern Bell's parent company, to undertake the largest ADSL offering in the United States. By the end of 1999, SBC intends to deploy ADSL in 526 central offices, which will enable it to provide ADSL service to 8.2 million residential and 1.3 million business customers. In California, Pacific Bell has announced that it will triple its current ADSL deployment and significantly lower the price of monthly service, installation and equipment. Connecticut-based SNET has filed with regulators to trial the service in that state beginning this month.

The company's long-range plans for offering ADSL service depend to some extent on forthcoming federal regulations. The speed and breadth of deployment will be affected by new rules the FCC is expected to issue in February outlining how regional Bell companies may offer advanced services such as ADSL. If current regulatory burdens are eased, the company would be able to accelerate deployment.

Southwestern Bell plans to offer "always on" ADSL service with guaranteed connection speed for as low as $39 a month, subject to FCC approval. In addition, Southwestern Bell Internet Services will offer Internet access with ADSL service for a combined price of as low as $49 per month. Equipment and installation will be available from Southwestern Bell for a one-time charge as low as $198.

By making the service widely available at an affordable price. Southwestern Bell will make high-speed Internet access a viable option for millions of households and small businesses who are

looking for greater bandwidth to make the most of the Internet or to connect to an enterprise or corporate network from home.

"Southwestern Bell would like to move fast in 1999 to provide a high-speed data service that our customers have been waiting for," said John Atterbury, president of Southwestern Bell. "We want Southwestern Bell ADSL service to become the high-speed Internet access of choice for millions of customers in our five-state region."

Competition to provide affordable, high-speed communications services used for Internet access and other computer applications is heating up. Southwestern Bell believes that demand for ADSL will soar once service is widely available and affordable. In fact, DataQuest, a market research company, predicts the number of ADSL subscribers to expand from 50,000 now to five million worldwide by 2002.

Southwestern Bell intends to deploy ADSL in 271 central offices which will enable it to provide high-speed Internet access to 3.2 million residential customers and 440,000 business customers, or more than 37 percent of its customers. If federal regulators issue favorable rules for delivering broadband services, Southwestern Bell could be making ADSL available by the end of this year in the company's major markets of Austin, Dallas, Houston, Kansas City, Little Rock, Oklahoma City, Tulsa, San Antonio and St. Louis.

ADSL: A Better Broadband Solution

With the $39 per month ADSL service, customers can simultaneously use a phone or a fax machine while getting downstream connection speeds up to 1.5 megabits per second-50 times faster than today's common 28.8 analog modems-and an upstream connection speed of 128 Kilobits per second. (Downstream throughput speeds will vary depending on the customer's distance from the central office and other factors, but the connection speed will be at a guaranteed minimum of 384 Kbps.)

For customers in need of higher speeds, Southwestern Bell will offer a package with downstream connection 200 times faster than today's 28.8 Kbps modems with speeds up to 6 Mbps and an upstream connection speed of 384 Kbps. Downstream connection speeds will be at a guaranteed minimum of 1.5 Mbps.

In addition to downloading data, graphics, audio and video, ADSL's speed transforms e-commerce transactions by creating faster responses for online traders and buyers, faster information exchanges between business partners and faster online sales.

When compared to cable modems, ADSL ensures greater reliability, better security and more consistent speeds, experts say, because the service is delivered via a dedicated line from a central office to the individual user's home or office. ADSL's "always on," dedicated connection provides a high degree of security and reliability for e-commerce, online banking and Internet trading, and enables customers to immediately surf the Internet or launch applications without waiting for a dial-up connection to be established. In addition, Southwestern Bell's ADSL service will run on the

Southwestern Bell network, one of the most reliable in the world. And customers who choose Southwestern Bell Internet Services as their Internet service provider will surf on one of the country's most sophisticated Internet backbones and benefit from award-winning service and support.

Regulatory Factor

"Southwestern Bell's objective is to offer ADSL to as many of our customers as possible, both business and residential," said Atterbury. "But regulations will play a part in how quickly we can do it."

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Southwestern Bell Telephone Company

Interconnector's Technical Publication

for Texas Physical Collocation

Issue 10
September 2, 1998

4.A SERVICE ORDER PROCESS

4.A.1 Following is an overview of how the interconnector will apply for Physical Collocation:

1. This SWBT document is intended to be given to prospective interconnectors to provide them the information outlining the responsibilities of each party in a collocation agreement. This document, which includes blank application forms, will be available from the Competitive Provider Account Team (CPAT) General Manager's Group. Upon request, SWBT will mail a copy to a potential interconnector. Any additional questions the potential interconnector may have should be referred to its Account Manager.

   The interconnector completed form will contain information SWBT requires to design the space/cage and ensure proper "in-place" equipment and cabling to interface SWBT's facilities with those of the prospective interconnector. The form also contains information (e.g., SWBT completion date, occupancy date, cable length, charges, etc.) the interconnector requires to accomplish physical collocation in SWBT's central offices.

2. An interconnector interested in collocating in a SWBT central office should complete the Application Form for Physical Collocation (one form per central office), and provide all pertinent information discussed in the following paragraphs, and submit it with a check for "Engineering Design Charges" (EDC) (one per request) to:

   SWBT-ICSC
   Attention: Project/Collocation Manager
   One Bell Plaza, Room 2800
   Dallas, Texas 75202

   Engineering Design Charges are found in Texas Tariff Section 2 Sheet 14 Paragraph 7.1. Engineering Design Charges include SWBT subject matter expert time to estimate the quotation of charges for space availability, cable distances, and work required to provide the requested Physical Collocation Arrangement. The Engineering Design Charge, as specified in the SWBT Technical Publication for Physical Collocation, recovers SWBT costs incurred to estimate the quotation of charges for the Collocator's request for the physical collocation arrangement. An initial Engineering Design Charge will apply to the Collocator's physical collocation request. In addition, a Non-standard Engineering Design Charge will apply when a request includes DC power requirements other than 20,40,50,100 or 200 AMPS or other than integrated ground plane, or when floor space requirements are greater than four hundred (400) square feet. Requests for additions to the initial request, such as the addition of Collocator provided equipment that requires SWBT to engineer and purchase additional equipment will result in a Subsequent Engineering Design Charge. A major revision to the initial request for physical collocation that changes floor space requirements, cable entrance facilities requirements, or changes DC Power Distribution, will be considered a total revision and result in the reapplication of a Initial Engineering Design Charge. Rates and charges are as found in the Texas Physical Collocation Tariff Section 2 Page 14 Paragraph 7.1.

3. The Dallas ICSC will note on the application the date and time received, then assign a case number to the application.

4. SWBT will design the collocation area where the interconnector will be located within SWBT's central office. Once the design is completed, SWBT will complete the "Confirmation for Collocation" form and forward to the interconnector. "Confirmation for Collocation" will contain information such as where the interconnector will be located and total charges for collocating in the central office. The written quotation of applicable charges will be provided to the interconnector within 15 business days following the initial receipt of

the EDC, the collocation agreement and completed application forms.

5. Should the Collocator submit six (6) or more applications within five (5) business days, the Quotation interval will be increased by ten (10) business days for every five (5) additional applications. This regulation also applies to any revisions to applications. For example:

Number of Multiple Applications	Quotation Interval
1-5	15 Business days
6-10	25 business days
11-15	35 business days
16-20	45 business days

If SWBT cannot meet the fifteen (15) day quotation interval stated above because multiple Collocators submitted multiple applications at the same time, SWBT will inform the Collocators of this situation within five days of receiving the applications and will establish new quotation intervals utilizing the above criteria.

SWBT will provided the quotation of the applicable nonrecurring and recurring tariff rates, and the estimated construction interval no later than as specified in 6.1.1 (D) following after receipt of the collocator's application. The collocator has sixty-five (65) business days. After sixty-five (65) business days a new application and engineering design charge are required.

7. **SWBT will not begin a collocation job until we have a final, complete, and accurate floor plan from the customer.**
Dedicated space is not reserved until the quotation is accepted and a final, complete, and accurate floor plan of the collocation area acceptable to SWBT is provided by the Collocator. The following information must be provided.

- Exact location of POT frames> i.e. exact footage from each wall and the direction the frames face
- Front Elevation of all POT frames
- Dimensions of POT frames
- Location in the cage of the Fiber entrance conduit
- Direction the panels face> i.e. front of the panels
- Complete labeling of the POT frame when provided by the collocator
- Relay Rack number, Shelf number, and VF Pair designation
- Location of convenience outlets and overhead light fixtures location of junction for essential Power circuits
- Location of DS1, DS3 and DS0 cable entrances

When the quotation is accepted, unless otherwise mutually agreed to by the Parties in writing, SWBT will complete construction of all Active Central Office Switchroom Space requests in three months from the receipt of the collocator's acceptance of the quotation and provision of the final, complete, and accurate floor plan of the collocation area. Unless otherwise mutually agreed to by the Parties in writing, SWBT will complete construction of all Other Central Office Space within six months from receipt of the collocator's acceptance of the quotation. If a completion date outside the time period required herein is not agreed to by the parties, the issue may be presented by either party to the Public Utility Commission of Texas for determination.

8. In the event that the Collocator cancels its order after SWBT has begun preparation of the

Infrastructure Area and Dedicated Space, but before SWBT has been paid the entire amounts due under this tariff, then in addition to other remedies that SWBT might have, the Collocator shall be liable in the amount equal to the non-recoverable costs less estimated net salvage, the total of which is not to exceed the Preparation Charges. Non-recoverable costs include the non-recoverable cost of equipment and material ordered, provided or used; the non-recoverable cost of installation and removal, including the costs of equipment and material ordered, provided or used; labor; transportation and any other associated costs. SWBT shall provide the Collocator with a detailed invoice showing the costs it incurred associated with preparation.

9. A list of all the equipment and facilities that the Collocator will place within its Dedicated Space must be included on the application for which the Dedicated Space is prepared including the associated power requirements, floor loading, and heat release of each piece. The Collocator's equipment and facilities shall be compliant with the standards set out in Paragraph 10.1 Minimum Standards, following. The Collocator warrants and represents that the List is complete and accurate, and acknowledges that any incompleteness or inaccuracy would be a violation of the rules and regulations governing this tariff. The Collocator shall not place or leave any equipment or facilities within the Dedicated Space not included on the List without the express written consent of SWBT, which consent shall not be unreasonably withheld.

10. The Collocator shall furnish SWBT a written list in the form of an attachment to the original equipment list for the subsequent placement of equipment in their Dedicated Space.

11. With respect to any preparation of the Dedicated Space, the Collocator shall pay SWBT fifty percent (50%) of the estimated nonrecurring Preparation Charges as specified for in Paragraph 2 Preparation Charges, preceding and fifty (50%)of any Custom Work Charges at the time that 50% of the work is completed.

    The remaining portion of any Custom Work charge is due upon completion. The remaining portion of the Preparation Charge shall be paid by the Collocator either (1) when the Dedicated Space is complete and prior to occupancy, or (2) in six (6) equal monthly installments, with a "carrying charge" based on the average prime commercial paper rate then in effect and applicable to under/overcharges as set forth in SUBST. R. 23.45(g). In the event the Collocator vacates the Dedicated Space.

12. Requirements based on requests from Collocators that are beyond what is provided for in this tariff, will be provided via the ICB process. An example of this is unique power requirements needed to meet the forecast and/or uniqueness of a Collocator.

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Southwestern Bell Plans Major Launch of New Lightning-Fast Service for Data, Internet Access

Parent Company SBC Announces Largest Deployment of ADSL in the U.S. and Major Price Drop to Make Service Affordable for Millions of Customers

San Antonio, Texas, January 12, 1999

Regulatory decisions key to scope of deployment

For up-to-the-minute news, visit http://www.swbell.com/dsl

The wait for affordable, high-speed, high-bandwidth Internet access may be near an end for millions of consumers and businesses. Southwestern Bell today announced plans to offer lightning-fast Internet and data access service in its five-state region beginning this year and today is filing the necessary tariffs with the Federal Communications Commission.

The launch of Asymmetrical Digital Subscriber Line (ADSL) in Southwestern Bell's five-state region of Texas, Missouri, Oklahoma, Arkansas and Kansas is part of a broader plan by SBC Communications, Southwestern Bell's parent company, to undertake the largest ADSL offering in the United States. By the end of 1999, SBC intends to deploy ADSL in 526 central offices, which will enable it to provide ADSL service to 8.2 million residential and 1.3 million business customers. In California, Pacific Bell has announced that it will triple its current ADSL deployment and significantly lower the price of monthly service, installation and equipment. Connecticut-based SNET has filed with regulators to trial the service in that state beginning this month.

The company's long-range plans for offering ADSL service depend to some extent on forthcoming federal regulations. The speed and breadth of deployment will be affected by new rules the FCC is expected to issue in February outlining how regional Bell companies may offer advanced services such as ADSL. If current regulatory burdens are eased, the company would be able to accelerate deployment.

Southwestern Bell plans to offer "always on" ADSL service with guaranteed connection speed for as low as $39 a month, subject to FCC approval. In addition, Southwestern Bell Internet Services will offer Internet access with ADSL service for a combined price of as low as $49 per month. Equipment and installation will be available from Southwestern Bell for a one-time charge as low as $198.

By making the service widely available at an affordable price, Southwestern Bell will make high-speed Internet access a viable option for millions of households and small businesses who are

looking for greater bandwidth to make the most of the Internet or to connect to an enterprise or corporate network from home.

"Southwestern Bell would like to move fast in 1999 to provide a high-speed data service that our customers have been waiting for," said John Atterbury, president of Southwestern Bell. "We want Southwestern Bell ADSL service to become the high-speed Internet access of choice for millions of customers in our five-state region."

Competition to provide affordable, high-speed communications services used for Internet access and other computer applications is heating up. Southwestern Bell believes that demand for ADSL will soar once service is widely available and affordable. In fact, DataQuest, a market research company, predicts the number of ADSL subscribers to expand from 50,000 now to five million worldwide by 2002.

Southwestern Bell intends to deploy ADSL in 271 central offices which will enable it to provide high-speed Internet access to 3.2 million residential customers and 440,000 business customers, or more than 37 percent of its customers. If federal regulators issue favorable rules for delivering broadband services, Southwestern Bell could be making ADSL available by the end of this year in the company's major markets of Austin, Dallas, Houston, Kansas City, Little Rock, Oklahoma City, Tulsa, San Antonio and St. Louis.

ADSL: A Better Broadband Solution

With the $39 per month ADSL service, customers can simultaneously use a phone or a fax machine while getting downstream connection speeds up to 1.5 megabits per second-50 times faster than today's common 28.8 analog modems-and an upstream connection speed of 128 Kilobits per second. (Downstream throughput speeds will vary depending on the customer's distance from the central office and other factors, but the connection speed will be at a guaranteed minimum of 384 Kbps.)

For customers in need of higher speeds, Southwestern Bell will offer a package with downstream connection 200 times faster than today's 28.8 Kbps modems with speeds up to 6 Mbps and an upstream connection speed of 384 Kbps. Downstream connection speeds will be at a guaranteed minimum of 1.5 Mbps.

In addition to downloading data, graphics, audio and video, ADSL's speed transforms e-commerce transactions by creating faster responses for online traders and buyers, faster information exchanges between business partners and faster online sales.

When compared to cable modems, ADSL ensures greater reliability, better security and more consistent speeds, experts say, because the service is delivered via a dedicated line from a central office to the individual user's home or office. ADSL's "always on," dedicated connection provides a high degree of security and reliability for e-commerce, online banking and Internet trading, and enables customers to immediately surf the Internet or launch applications without waiting for a dial-up connection to be established. In addition, Southwestern Bell's ADSL service will run on the

Southwestern Bell network, one of the most reliable in the world. And customers who choose Southwestern Bell Internet Services as their Internet service provider will surf on one of the country's most sophisticated Internet backbones and benefit from award-winning service and support.

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COMMITTEE T1 – TELECOMMUNICATIONS
Working Group T1E1.4 (DSL Access)
Orlando, Florida; February 1-5, 1999

CONTRIBUTION

TITLE: **Binder Group Segregation is not Feasible**

SOURCE: **Bell Atlantic**

PROJECT: **T1E1.4, Spectral Compatibility**

Abstract

This contribution argues that binder group segregation is neither practical nor feasible for mass market technologies and should neither be required nor recommended in order to demonstrate spectral compatibility using the analytical method (Method B) to be defined in the spectrum management standard currently under development in T1E1.4.

Introduction

Services and transmission system technologies must coexist, and be compatible with, other services and transmission technologies that operate in the local loop environment. In order to achieve spectral compatibility, energy that transfers into a loop pair, from services and transmission system technologies on other pairs in the same cable, must not cause an unacceptable degradation of performance. In addition, energy in a particular loop pair must not transfer into other pairs in a manner that causes an unacceptable degradation in the performance of services and technologies on those pairs.

Electromagnetic energy that couples into a metallic cable pair from services and technologies on other pairs in the same cable is called crosstalk. The amount of crosstalk depends upon the exposure or proximity of metallic pairs. The greater the exposure, the greater the total crosstalk power.

Binder group segregation is a spectrum management tool that attempts to control crosstalk by increasing the physical distance between different types of technologies in a loop cable. Since it is impossible to predict the exact amount of exposure between any two pairs in a loop cable, this contribution argues that binder group segregation for mass market technologies should neither be required nor recommended in order to demonstrate spectral compatibility using the analytical method (Method B) soon to be defined in the spectrum management standard.

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Binder Groups and Pair Units
A binder group is a pair unit or a multiunit that has been assembled together and bound with colored binder tape for identification. A pair unit may consist of 12, 13, or 25 pairs. A multiunit consists of subunits that have been assembled together into a collection of 50 or 100 pairs. For example, a 50 pair multiunit can consist of two 12 pair subunits and two 13 pair subunits and a 100 pair multiunit can consist of four 25 pair subunits. So, the most common binder group sizes are 12, 13, 25, 50, or 100 pairs.

Crosstalk Coupling Loss
The amount of loss between any two pairs in a cable is called the crosstalk coupling loss. It is generally believed that, in any section of cable, the crosstalk coupling loss between pairs in the same binder group is less than the crosstalk coupling loss between pairs in adjacent binder groups. It is also believed that the crosstalk coupling loss between pairs in adjacent binder groups is less than the crosstalk coupling between pairs in non-adjacent binder groups. These assumptions are based on the fact that the crosstalk coupling loss, at any particular frequency, decreases as exposure increases. Exposure is a measure of the proximity of metallic pairs at various points along a cable run and the length over which pairs are in close proximity.

In early spectral compatibility work involving metallic interoffice facilities, the terms "***same binder group***", "***adjacent binder group***", and "***non-adjacent binder group***" had some basis in reality and were used to describe the actual degree of physical proximity and the expected crosstalk coupling performance. Loop facilities are much different than interoffice facilities however because they do not generally have binder group integrity. That is, the continuity of binder groups and the relationship of binder groups is not maintained in most loop cables.

Non-Adjacent Binder Groups
The loop plant generally consists of large feeder cables near the Central Office (CO) with successive cables becoming smaller and smaller the farther you get from the CO. The smallest cable used for a loop is usually the cable going to the terminal that serves the customer location. Although metallic cables are manufactured with pairs twisted together into pair units or binder groups, no attempt is made to maintain the relationship of one binder group to another binder group when loop cables are spliced together. This means that in the loop environment the terms "***adjacent binder group***" and ***"non-adjacent binder group"*** can rarely be used with confidence.

Binder groups that were non-adjacent in one cable section may become adjacent in the next cable section after passing a splice point. This often occurs in loop plant when some of the pairs of a large cable are spliced into a smaller cable that has fewer "non-adjacent" binder groups. Table A shows that the percentage of pairs that can be considered to be in non-adjacent binder groups decreases as the cable gets smaller. This means that while we may begin at the CO in non-adjacent binder groups, the likelihood of loop pairs remaining in non-adjacent binder groups decreases as the cable size gets smaller.

Assume that 300 pairs of a 900 pair cable consist of three 100-pair binder groups (call these binder groups A, B, and C) and that binder group A is adjacent to binder group B and non-adjacent to binder group C (see Figure 1). If these pairs are spliced into a 300-pair cable (see figure 2), the three 100-pair binder groups will be spliced into six 50-pair binder groups. There is no way to join these cables so that all of the pairs that were in non-adjacent binder groups in the 900-pair cable will remain in non-adjacent binder groups in the 300-pair cable. (Most methods of splicing these cables together will result in no pairs in non-adjacent binder groups but by careful binder group selection, as illustrated in Figure 3, 50 pairs could end up in non-adjacent binder groups.) Normally a technician would not have made such an effort to select binder groups in this fashion since this is not a requirement for POTS loops. In addition, no record is kept of how the dissimilar cables were spliced together so the fact that 50 pairs did or did not maintain their non-adjacent relationship would not be known. Under these circumstances, the only prudent thing, in this example, would be to assume that none of the pairs in the 300-pair cable were in non-adjacent binder groups.

Since the loop plant was designed to support voicegrade services, there was no requirement to maintain the relationship of binder groups when loop cables were spliced together. So in the loop environment, it is very rare to find two binder groups, that serve the same customer location, that would truly qualify as being "***non-adjacent***" and, if you actually had non-adjacent binder groups, you may not know it because there is no record of it.

Adjacent Binder Groups
When the loop plant was built, no attempt was made to maintain the relationship of pairs in a particular binder group to other pairs in the same binder group. Thus, in the real-world loop environment the terms "***same binder group***" and ***"adjacent binder group"*** cannot be used with confidence. Pairs that are in adjacent binder groups in one cable section may end up in the same binder group in the next cable section after passing a splice point. Likewise, pairs that are in the same binder group may end up in different binder groups after a splice. This often happens in the loop plant when pairs in a large binder group in one cable are spliced into smaller binder groups of another cable.

For example, assume that a pair begins in a 12 pair subunit of a 50-pair cable at the customer's serving cable terminal. It is considered to be adjacent to three other subunits (like the 50-pair multiunit shown in Figure 2). When this 50-pair cable is spliced into a 100-pair cable, the 12 pair subunit and another 13 pair subunit will be combined and spliced into a 25 pair subunit (like the 100-pair multiunit in Figure 1). Thus, the adjacent binder groups have become the same binder group. When the 100-pair cable is subsequently spliced into a 300-pair cable, that 25-pair unit and another 25-pair unit will be combined and spliced into a 50 pair multiunit. Again, two binder groups have become one binder group. When the 300-pair cable is subsequently spliced into a 900-pair cable, the 50-pair multiunit and another 50-pair multiunit will be combined and spliced into a 100 pair multiunit. So, several pairs that started out in separate binder groups have ended up in the same binder group.

Another problem that impacts binder group integrity, is that over the years no attempt has been made to maintain the relationship of pairs in the same binder group during maintenance activities since the primary objective is continuity not high frequency crosstalk coupling. So again, pairs that started out in different binder groups may end up in the same binder group after maintenance activity.

Since no record has been kept of exactly how every splice or repair was accomplished, the relationship between the pairs inside of a loop cable cannot be discerned from cable records.

Since the loop plant was designed to support voicegrade services, there was no requirement to maintain the relationship of binder groups when loop cables were spliced together. So in the loop environment, it is very rare to find two binder groups serving a customer location that would truly qualify as being ***"adjacent"*** and, if you actually had adjacent binder groups, you would not know it because there is no record of it.

Loop Assignment Systems

Existing loop assignment systems can identify the cables and pairs that appear in the cable terminal serving a particular customer location. These systems can automatically assign a spare pair (if one exists) for a most services, but they cannot segregate services by binder groups. Loop assignment systems would require costly modifications in order to provide the capability to identify the binder groups that appear in the cable terminal serving a particular customer location, identify the permissible technologies, and automatically assign a spare pair. Even if such system modifications were made however, the lack of binder group integrity makes binder group segregation on a large scale impractical.

Even if support systems could assign by binder group type, which they cannot, how would such information be determined? As mentioned earlier, no record is kept on how cables are spliced together. The information does not exist.

Spectrum Management Loop Assignment Guidelines

Binder group segregation in the form of loop assignment guidelines are sometimes used in an attempt to manage the proximity of incompatible technologies. Incompatible technologies are assigned to pairs that the carrier believes are in different binder groups. Since cable records and loop assignment systems cannot determine the amount of exposure between any two pairs in a cable when new services are assigned a loop pair, loop assignment guidelines are often limited to mitigating interference problems after they are discovered. In these maintenance situations, it is assumed that, where interference exists, there must be a good deal of exposure. Decreasing the amount of exposure can be an effective spectrum management tool however the effectiveness is limited by the lack of binder group integrity and the fact that the likelihood of having adjacent or non-adjacent binder groups available at the customer's serving cable terminal is quite small.

Conclusion

Binder group segregation can be an effective spectrum management tool for a carrier in certain limited situations. It is up to each carrier to determine the situations where it would be practical.

Since it is impossible to predict the exact amount of exposure between any two pairs in a loop cable, binder group segregation is not feasible for mass market technologies and should neither be required nor recommended in order to demonstrate spectral compatibility using the analytical method (Method B) soon to be defined in the spectrum management standard.

The only reasonable and practical way to conduct crosstalk margin evaluations is to use statistical exposure models that simulate real-life conditions (i.e., pairs that are in the same binder group). If different technologies are compatible when evaluated using same binder group crosstalk coupling factors, then the technologies will be compatible when they are in different binder groups.

Table A: Percent of Non-Adjacent Binder Groups for Various Cable Sizes

No. of Pairs in Cable	No. of Binder Groups	Percent of Non-adjacent BGs
50	4	0
100	4	0
150	5/1	33
200	6/1	37.5
300	5/1	33
400	6/1	37.5
600	9/3	50
900	7/2	44
1200	9/3	50
1500	9/6/1	60
1800	12/5/1	78
2400	13/8/3	75

Figure 1 - 900 pair cable
(nine 100-pair multiunits)

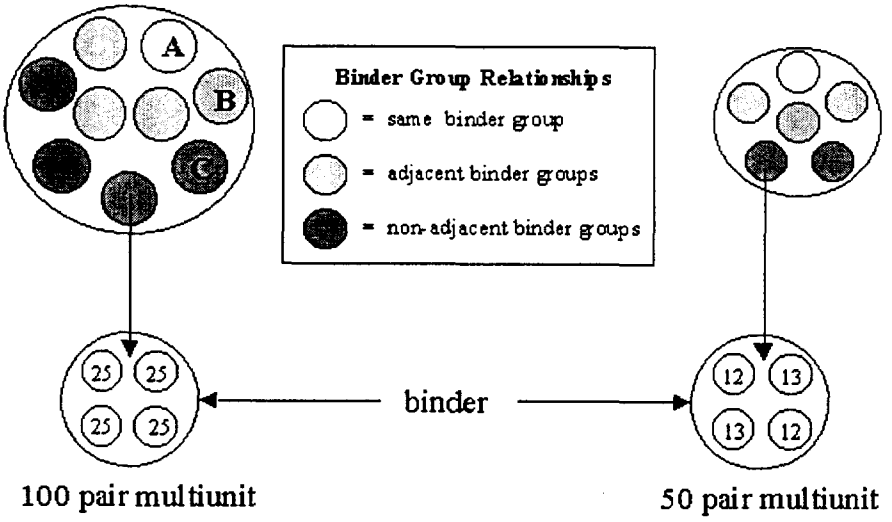
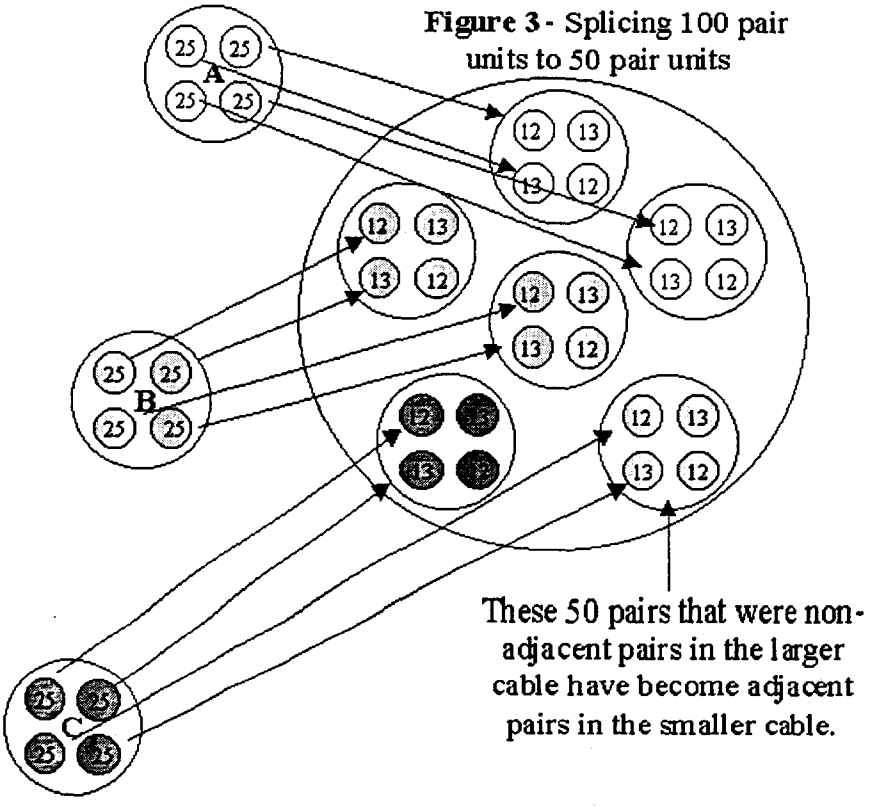


Figure 2 - 300 pair cable
(six 50-pair multiunits)

Figure 3 - Splicing 100 pair units to 50 pair units



COMMITTEE T1 – TELECOMMUNICATIONS
Working Group T1E1.4 (DSL Access) **T1E1.4/99-021**
Orlando, Florida; February 1, 1999

CONTRIBUTION

TITLE: **Binder Group Fill**

SOURCE: **Bellcore and Ameritech**

PROJECT: **T1E1.4, Spectrum Management**

ABSTRACT

It is proposed for the Spectrum Management standard to include the following principles:

1. Spectrum management of systems should be based on the expected six-year 99% worst-case statistical probability of binder fill.
2. System performance tests in the presence of crosstalk should be based on the expected six-year 99% worst-case statistical probability of binder fill with BER $\leq 10^{-7}$ and margin of at least 6 dB.

It is recognized that binder group segregation can substantially improve ADSL performance. However, for the reasons stated at the end of section 2 of this contribution, binder group segregation (except for T1-carrier) may not be feasible in some service areas. The Spectrum Management standard should not require binder group segregation for ADSL, but it could address it as an option.

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1. Introduction

A cable pair is two conductors (tip and ring) which are twisted together in order to improve the pair balance and thus decrease the crosstalk coupling. To improve the pair balance further, cable pairs are twisted together into a group called a binder. Theoretically, any two pairs inside a binder maintain their relative position as an observer moves down the cable.

Generally, outside plant cables are terminated in the cable vault of a CO. From here CO cabling is spliced to the outside plant pairs and run to the main frame. Outside plant cables can have binder groups of as much as 100 pairs, while CO cabling is frequently 25 pairs. Binder group identity is not always unambiguously traceable back to the main frame. Cable plant records identify pair number, but not the binder group.

General information about cable codes and binder group structure is given in the Appendix of this contribution.

2. Guiding Principles

- The Spectrum Management Standard should assure reliable service for all customers.
  The number and types of services and crosstalk disturbers will vary greatly across the population of binder groups. This will be a very broad statistical distribution that will vary over the span of several years.

- The 50 pair binder group should form the basis for the crosstalk model of the Spectrum Management Standard.
  Binder groups come in several sizes and it is not unusual for large cables leaving a Central Office to have binder groups of 100 pairs, 50 pairs or 25 pairs. The 50 pair binder group has been normally used for crosstalk studies because it provides a reasonable model.

- Spectrum Management should be based on expected six-year 99% worst-case statistical probabilities for binder fills of different and perhaps mixed DSL types. We do not mean that 99% of the cable pairs are occupied by disturbers, but rather that the number of disturbers for this case represents the fill in at least 1% of all binder groups nation-wide. This worst-case fill should refer to the point in time when the statistical population has reached its maximum deployment over the six-year period following publication of the Spectrum Management standard. A Spectrum Management standard based on 50% expected statistical probability binder fills would be unwise since potentially one-half of all DSL systems could then be at risk of poor operation.

- Binder group segregation can substantially improve ADSL performance. However, for the reasons stated below, binder group segregation with the exception of T1-carrier, which has extraordinary overlap in transmitted bandwidth and power with DSL systems, may not be feasible in some service areas:
  1. It will be costly and take many years to modify existing loop assignment systems for use in tracking binder group assignment and fill.
  2. There is considerable cost that results from stranded pairs in special-use binder groups.
  3. There is still the potential for crosstalk within the main frame and riser cable in the CO and within the end customer's wiring.

4. Some subscribers will not be able to obtain some services because of binder group exhaustion.
5. A subscriber will not be able to obtain multiple services if there is only a single binder group that runs past his drop.
6. As more and more new services are introduced, binder groups will be quickly exhausted.

The Spectrum Management standard should not require binder group segregation for ADSL, but it could address it as an option.

3. Numbers of Disturbers for 99% Worst Case Binder Fill

In order to evaluate new DSL systems in the presence of crosstalk, it is necessary that the Spectrum Management Standard give guidance regarding the type and number of disturbers in a expected six-year 99% worst-case statistical probability of binder fill.

3.1 Single Disturber Type Models

The number of disturbers proposed are based on our expectation of the 99% six-year worst case binder fills:

ISDN: 24 (from T1.413)[1]
HDSL: 24 (from T1.413)
HDSL2: 39 (from HDSL2 draft standard)[2]
ADSL (non-overlap): 39
DDS: 8
T1 (adjacent binder): 24 (from HDSL2 draft standard)

3.2 Mixed Disturber Types

Models for mixed disturber types require further study.

4. Performance Objectives

McDonald has discussed performance margin issues in a prior contribution[3]. The question of how much margin is difficult to answer and depends on the uncertainty of various impairments. The margin requirement of 6 dB used for Basic Rate Access DSLs may seem excessive in the present understanding of the technology and the capabilities of digital LSI chips. However, as digital technology has lessened the uncertainty concerning transceiver impairments, the increasing frequency band of system operation has unfortunately led to other uncertainties. For example, the difference in 500 kHz attenuation of 26-AWG PIC cable at 120°F and 70°F is 4 dB for a 12kft loop. In addition, other factors such as the many splice points in a typical loop and the effects of service-drop, subscriber inside wire and CO wiring cannot be given short shrift.

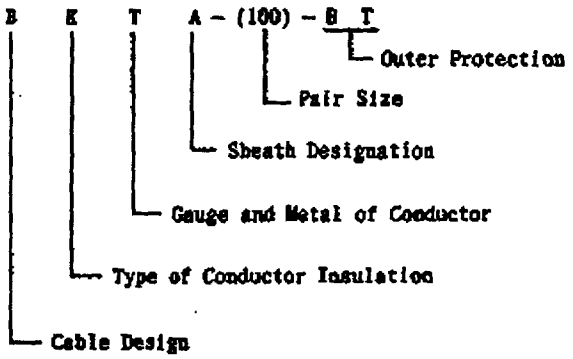
It is recommended that the Spectrum Compatibility Standard include the provision by which DSL system performance tests in the presence of crosstalk should be based on the expected six-year 99% worst-case statistical probability of binder fills with BER $\leq 10^{-7}$ and margin of at least 6 dB. These performance objectives have long been associated with DSL standards beginning with ISDN basic access and are also currently present in the ADSL standard T1.413.

Appendix: Cable and Binder Group Background

The following information is taken from Bell System practices[4].

Exchange Area Cable Coding Plan:

Standard cables are coded with a 4-letter prefix to simplify their designation in ordering, manufacturing, and on records.



Example:
Second design polyethylene insulated 26-gauge copper conductor with ALPETH sheath and buried tape armor.

1ST LETTER: CABLE DESIGN

- A = PIC Waterproof, Pulp Air Core or PIC Riser
- B = PIC Air Core
- C = Pulp MUP, Pseudo-MUP, or High Potential Waterproof
- D = PIC – Steampeth or Ductpic or MAXPAC
- E = Screened Core
- L = Low Capacitance
- M = Low Capacitance Screened Core

Note: All except L and M are 83 nf/mile capacitance

3RD LETTER: GAUGE AND METAL OF CONDUCTOR

GAUGE	COPPER
19	B
22	A
24	M
25	R
26	T

2ND LETTER: CONDUCTOR INSULATION

- B = PE-PVC (Polyethylene/Polyvinyl Chloride)
- C = Dual Expanded Polyolefin
- D = Pulp and TUFFULP Cable
- F = Dual Expanded Polyolefin-Core With FLEXGEL* Filling Compound
- G = Solid Polyolefin – Core Filled with FLEXGEL* Filling Compound
- H & K = Solid Polyolefin – Air Core
- J = Solid Polyolefin – Petroleum Jelly-Filled Core
- L = Dual Expanded Polyolefin – Petroleum Jelly-Filled Core
- R = XPE-PVC (Expanded Polyethylene/Polyvinyl Chloride)

Notes:
1. Polyolefin material is generally a high-density polyethylene except J may be polypropylene. H and K, when used with a PIC STEAMPETH, are stabilized polypropylene.

* Trademark of Western Electric.

4TH LETTER: SHEATH DESIGNATION

- A - ALPETH
- C - STALPETH
- E - POLYJACKETED LEAD
- G - PAP
- H - PASP (Bonded or Nonbonded)
- L - LEAD
- M - ALVYN
- N - Bonded STEAMPETH
- P - Reinforced Self-Support
- S - Self-Support
- T - ARPAP
- V - STEAMPETH
- W - ASP
- Y - Bonded ASP (1)
- Z - Bonded STALPETH

(1) - Not currently manufactured.

OUTER PROTECTION CODES:

- AT = Aerial Tape Armor
- BT = Buried Tape Armor
- MP = Mechanical Protection
- UM = Unsoldered Mechanical Protection
- LA = Light Wire Armor
- SA = Submarine, Single Armor
- DA = Submarine, Double Armor

Binder Groups:

PIC Color Code

The 25 pairs of a binder group are identified as follows:

Tip Color \ Ring Color	Cable Pair Number				
	Blue (BL)	Orange (O)	Green (G)	Brown (BR)	Slate (S)
White (W)	1	2	3	4	5
Red (R)	6	7	8	9	10
Black (BK)	11	12	13	14	15
Yellow (Y)	16	17	18	19	20
Violet (V)	21	22	23	24	25

In a cable of more than 25 pairs, the binder groups are identified by the same code, using a pair of colored plastic tapes as binders.

Twelve 50-pair multiunits form a 600-pair cable. Each multiunit has two 25-pair binder groups with a white plastic-tape binder over all. In a 900-pair cable, the first 600 pairs are identical to a 600-pair cable. The last 300 pairs are like the first 300 pairs of a 600-pair cable, except that the multiunit binders are red.

PULP CABLE BINDER GROUP SIZES BSP 626-100-005, -006

CDA and KDA (22-gauge) cables have 50-pair binder groups. ADB (19-gauge, rated Nonstandard-Limited Availability) has 25-pair binder groups.

In CD-type Multi-Unit Pulp (MUP) cables, each 50-pair binder group or multiunit is further divided into two 12-pair and two 13-pair primary units; each 100-pair multiunit is divided into four 25-pair primary units.

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[1] T1.413
[2] HDSL2 Draft Standard
[3] R. A. McDonald, "Performance Margin Issues in DSLs", T1E1.4/95-133.
[4] See BSP 626-020-011, BSP 626-020-020, BSP 626-225-107, BSP 626-759-020 and BSP 626-101-005.

Rebecca Villalobos

From: JUSTICE, DORIS J (SWBT) [dj8802@txmail.sbc.com]
Sent: Tuesday, February 02, 1999 3:48 PM
To: Rebecca Villalobos
Subject: SWB Quote Intervals

February 2, 1999

Rebecca Villalobos -via electronic mail-
COVAD Communications

Dear Rebecca:

Enclosed are the SWBT collocation quote intervals for the applications received on 1/27/99..
<<SWB Quote intervals.doc>>

Additionally, SWBT received applications for the following locations that do not belong to SWBT:

AUSTTXCF = TIME WARNER LOCATION PER THE BELLCORE LERG
AUSTTXLA = CUSTOMER LOCATION

Doris Justice
Southwestern Bell
Account Manager-LPAT
214-464-4778 voice
214-745-4843 fax
dj8802@txmail.sbc.com

	ACNA	CLLI	PHYSICAL CLLI	TARIFF/ICB QUOTE INTERVAL	TX TARIFF QUOTE DATE	BAN	LPAT Manager	Telephone
COVAD	OVC	[redacted]		115	7/9/99	710 002-8182	HERRERA	214-745-4836
COVAD	OVC	[redacted]		115	7/9/99	510 002-1301	SIFUENTES	214-464-3770
COVAD	OVC	[redacted]		115	7/9/99	610 002-3190	REDD	214-464-3841
COVAD	OVC	[redacted]		115	7/9/99	710 002-8183	HUDSON-JONES	214-745-4832
COVAD	OVC	[redacted]		115	7/9/99	510 002-1302	FREEMAN	214-745-4827
COVAD	OVC	[redacted]		125	7/23/99	610 002-3191	HERRERA	
COVAD	OVC	[redacted]		125	7/23/99	710 002-8184	SIFUENTES	
COVAD	OVC	[redacted]		125	7/23/99	510 002-1303	REDD	
COVAD	OVC	[redacted]		125	7/23/99	610 002-3192	HUDSON-JONES	
COVAD	OVC	[redacted]		125	7/23/99	710 002-8185	FREEMAN	
COVAD	OVC	[redacted]		135	8/6/99	510 002-1304	HERRERA	
COVAD	OVC	[redacted]		135	8/6/99	610 002-3193	SIFUENTES	
COVAD	OVC	[redacted]		135	8/6/99	710 002-8186	REDD	
COVAD	OVC	[redacted]		135	8/6/99	510 002-1305	HUDSON-JONES	
COVAD	OVC	[redacted]		135	8/6/99	610 002-3194	FREEMAN	
COVAD	OVC	[redacted]		145	8/20/99	710 002-8187	HERRERA	
COVAD	OVC	[redacted]		145	8/20/99	610 002-3195	SIFUENTES	
COVAD	OVC	[redacted]		145	8/20/99	710 002-8188	REDD	
COVAD	OVC	[redacted]		145	8/20/99	510 002-1306	HUDSON-JONES	
COVAD	OVC	[redacted]		145	8/20/99	610 002-3196	FREEMAN	
COVAD	OVC	[redacted]		155	9/3/99	710 002-8189	HERRERA	
COVAD	OVC	[redacted]		155	9/3/99	510 002-1307	SIFUENTES	
COVAD	OVC	[redacted]		155	9/3/99	610 002-3197	REDD	
COVAD	OVC	[redacted]		155	9/3/99	710 002-8190	HUDSON-JONES	

COVAD	OVC	[redacted]	155	9/3/99	510 002-1308	FREEMAN
COVAD	OVC	[redacted]	165	9/20/99	610 002-3198	HERRERA
COVAD	OVC	[redacted]	165	9/20/99	710 002-8191	SIFUENTES
COVAD	OVC	[redacted]	165	9/20/99	510 002-1309	REDD
COVAD	OVC	[redacted]	165	9/20/99	610 002-3199	HUDSON-JONES
COVAD	OVC	[redacted]	165	9/20/99	610 002-3200	FREEMAN
COVAD	OVC	[redacted]	175	10/4/99	710 002-8192	HERRERA
COVAD	OVC	[redacted]	175	10/4/99	510 002-1310	SIFUENTES
COVAD	OVC	[redacted]	175	10/4/99	610 002-3201	REDD
COVAD	OVC	[redacted]	175	10/4/99	710 002-8193	HUDSON-JONES
COVAD	OVC	[redacted]	175	10/4/99	510 002-1311	FREEMAN
COVAD	OVC	[redacted]	185	10/18/99	610 002-3202	HERRERA
COVAD	OVC	[redacted]	185	10/18/99	710 002-8194	SIFUENTES
COVAD	OVC	[redacted]	185	10/18/99	510 002-1312	REDD
COVAD	OVC	[redacted]	185	10/18/99	610 002-3203	HUDSON-JONES
COVAD	OVC	[redacted]	185	10/18/99	710 002-8195	FREEMAN
COVAD	OVC	[redacted]	195	11/1/99	510 002-1313	HERRERA
COVAD	OVC	[redacted]	195	11/1/99	510 002-1314	SIFUENTES
COVAD	OVC	[redacted]	195	11/1/99	510 002-1315	REDD
COVAD	OVC	[redacted]	195	11/1/99	610 002-3204	HUDSON-JONES
COVAD	OVC	[redacted]	195	11/1/99	710 002-8196	FREEMAN
COVAD	OVC	[redacted]	205	11/15/99	510 002-1316	HERRERA
COVAD	OVC	[redacted]	205	11/15/99	610 002-3205	SIFUENTES
COVAD	OVC	[redacted]	205	11/15/99	710 002-8197	REDD
COVAD	OVC	[redacted]	205	11/15/99	510 002-1317	HUDSON-JONES
COVAD	OVC	[redacted]	205	11/15/99	610 002-3206	FREEMAN
COVAD	OVC	[redacted]	215	12/1/99	710 002-8198	HERRERA

	address				
COVAD	OVC [redacted]	215	12/1/99	510 002-1318	SIFUENTES
COVAD	OVC [redacted]	215	12/1/99	610 002-3207	REDD
COVAD	OVC [redacted]	215	12/1/99	510 002-1319	HUDSON-JONES
COVAD	OVC [redacted]	215	12/1/99	610 002-3208	FREEMAN
COVAD	OVC [redacted]	225	12/15/99	510 002-1320	HERRERA
COVAD	OVC [redacted]	225	12/15/99	610 002-3209	SIFUENTES
COVAD	OVC [redacted]	225	12/15/99	510 002-1321	REDD
COVAD	OVC [redacted]	225	12/15/99	610 002-3210	HUDSON-JONES
COVAD	OVC [redacted]	225	12/15/99	510 002-1322	FREEMAN
COVAD	OVC [redacted]	235	12/30/99	610 002-3211	HERRERA
COVAD	OVC [redacted]	235	12/30/99	510 002-1323	SIFUENTES
COVAD	OVC [redacted]	235	12/30/99	610 002-3212	REDD
COVAD	OVC [redacted]	235	12/30/99	510 002-1324	HUDSON-JONES
COVAD	OVC [redacted]	235	12/30/99	610 002-3213	FREEMAN
COVAD	OVC [redacted]	245	1/14/00	510 002-1325	HERRERA
COVAD	OVC [redacted]	245	1/14/00	610 002-3214	SIFUENTES
COVAD	OVC [redacted]	245	1/14/00	510 002-1326	REDD
COVAD	OVC [redacted]	245	1/14/00	610 002-3215	HUDSON-JONES
COVAD	OVC [redacted]	245	1/14/00	510 002-1327	FREEMAN
COVAD	OVC [redacted]	255	1/28/00	610 002-3216	HERRERA
COVAD	OVC [redacted]	255	1/28/00	510 002-1328	SIFUENTES
COVAD	OVC [redacted]	255	1/28/00	610 002-3217	REDD
COVAD	OVC [redacted]	255	1/28/00	510 002-1329	HUDSON-JONES
COVAD	OVC [redacted]	255	1/28/00	610 002-3218	FREEMAN
COVAD	OVC [redacted]	265	2/11/00	610 002-3219	HERRERA
COVAD	OVC [redacted]	265	2/11/00	610 002-3220	SIFUENTES
COVAD	OVC [redacted]	265	2/11/00	610 002-3221	REDD